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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/576,883

11/28/2006

Patrick Rondier

1200.748

6149

7590
Longacre & White
Suite 240
6550 Rock Spring Drive
Bethesda, MD 20817

11/19/2007

EXAMINER

HOFFBERG, ROBERT JOSEPH

ART UNIT

PAPER NUMBER

2835

MAIL DATE

DELIVERY MODE

11/19/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/576,883

Applicant(s)

RONDIER ET AL.

Examiner

Robert J. Hoffberg

Art Unit

2835

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 April 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Detailed Action

Response to Arguments

1. Applicant's arguments with respect to claims 1-4 and 6-21 have been considered but are moot in view of the new ground(s) of rejection.
2. The examiner's drawing objection is maintained. Amended figure 1 has not been filed.
3. The examiner's objection to the specification is withdrawn based upon the applicant's amendment.

Drawings

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: #97 (Fig. 1). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

5. Claims 16-18 are objected to because of the following informalities: While the applicant describes the manifold 27 as a single manifold having an inlet and outlet, the manifold is an inlet manifold 27a and an outlet manifold 27b as is shown as two separate details. Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Capriz et al. (US 6,661,658).

With respect to Claim 1, Capriz et al. teach a device for cooling power electronics comprising: a support plate (2) on which the power electronics are mounted, a first pressed metal plate (6) including liquid circulation channels (9) press-formed (Col. 4, line 11) in said first metal plate; wherein characterised in that it comprises a cooling circuit for cooling by circulation of a liquid (10) is defined by said liquid circulation channels mounted directly or indirectly to the support plate.

With respect to Claim 2, Capriz et al. further teach the cooling circuit comprises a liquid inlet channel (16), a liquid outlet channel (17) and said

circulation channels (9) for the circulation of the liquid between the inlet channel and the outlet channel (claim 2).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 6-8, 10, 19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Capriz et al. (US 6,661,658).

With respect to Claim 6, Capriz et al. teach a cooling device for cooling power electronics, comprising: a support plate (2) on which the power electronics (5) are mounted. a first pressed metal plate (6) including liquid circulation channel press-formed (Col. 4, line 11) in said first metal plate; wherein a cooling circuit for cooling by circulation of a liquid (10) is defined by said liquid circulation channel fixed directly to the support plate, said circulation channels facing the support plate to provide a closed-loop (see Fig. 2) fluid path extending between an inlet (16) and an outlet (17) of the cooling circuit, wherein the first pressed metal plate having the cooling circuit is fixed to the support plate by brazing (15 and Col. 3, line 57). Capriz et al. fail to disclose a plurality of cooling channels. It would have been obvious to one having ordinary skill in the art at the time the invention was made to duplicate the circulation channels and have a plurality of cooling channels for increased cooling capacity, since it has been held that a

mere reversal of the essential working parts of a device involves only routine skill in the art. *In re Einstein*, 8 USPQ 167.

With respect to Claim 7, Capriz et al. disclose the claimed invention except for a second intermediate metal plate. It would have been obvious to one having ordinary skill in the art at the time the invention was made to separate the support plate of Capriz into two layers having an a second intermediate layer between the support layer and first pressed metal plate, since it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art. *Nerwin v. Erlichman*, 168 USPQ 177, 179.

With respect to Claim 8, Capriz et al. further teach that the second metal plate (lower layer of 2) is flat (see Fig. 5), brazed (15 and Col. 3, line 57) to the first pressed metal plate.

With respect to claim 10, Capriz et al. disclose that liquid cooled heat sinks are made from aluminum, but fail to disclose that the first metal plate is made of aluminum. It would have been obvious to one having ordinary skill in the art at the time the invention was made to fabricate the first metal plate from a good thermal conducting metal of aluminum, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

With respect to Claim 19, Capriz et al. disclose the claimed invention except for an alternator or alternator/starter for a motor vehicle. It would have been an obvious matter of design choice to use the claimed invention for cooling

power electronics in any application including as an alternator or alternator/starter for a motor vehicle, since applicant has not disclosed that solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with cooling any power electronics device in any application.

With respect to Claim 22, Capriz et al. teach a device for cooling power electronics, comprising: a support plate (2) on which the power electronics (5) are mounted, said support plate being planar (Fig. 5); a first plate (6) including a liquid circulation channel (9) formed in said first metal plate, said circulation channel extending in different directions (see Fig. 2), wherein a cooling circuit (9) for cooling by circulation of a liquid is defined by said liquid circulation channels. Capriz et al. fail to disclose a plurality of cooling channels. It would have been obvious to one having ordinary skill in the art at the time the invention was made to duplicate the circulation channels and have a plurality of cooling channels extending in different directions for increased cooling capacity over the entire planar surface, since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art. *In re Einstein*, 8 USPQ 167.

10. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Capriz et al. (US 6,661,658) in view of Fukazu et al. (US 6,648,062).

Capriz et al. disclose the claimed invention except for deflectors. Fukazu et al. teach the cooling circuit comprises deflectors (19) situated in the liquid circulation channels (6) (claim 3). It would have been obvious to one of ordinary

skill in the art at the time of the invention was made to modify the cooling device of Capriz et al. with the deflectors of Fukazu et al. for the purpose of providing a means to guide the coolant flow (Col. 4, line 34).

11. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Capriz et al. (US 6,661,658) in view of Pfeifer et al. (US 7,068,507).

Capriz et al. disclose the claimed invention except for turbulators. Pfeifer et al. teach the cooling circuit comprises turbulators (Fig. 7, 290a) distributed in the liquid circulation channels (see Fig. 7) (claim 4). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the cooling device of Capriz et al. with the turbulators of Pfeifer et al. for the purpose of providing a means to create turbulence for increased cooling of the cooling circuit.

12. Claims 9, 12, 15-17 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Capriz et al. (US 6,661,658) in view of Strähle et al. (US 6,662,859).

With respect to Claims 9, 12 and 15, Capriz et al. disclose the claimed invention except for a metal manifold. Strähle et al. disclose a metal manifold (44) connected to the cooling circuit (28) (claim 9) and the pressed plate is fixed directly by brazing (Col. 3, line 57) to the support plate (claim 12) and the support plate (27) carries the manifold (claim 15). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the cooling device of Capriz et al. with the manifold of Strähle et al. for the purpose of providing a means to connect a fluid circulation device to the cooling circuit.

With respect to Claim 16, Capriz et al. teach a method of manufacturing a power electronics cooling device, comprising the steps of: producing a cooling circuit (9) by pressing (Col. 4, line 11) a first metal plate (6) to integrally and homogenously form liquid circulation channels in said first metal plate, brazing the cooling circuit on a support plate for the power electronics, brazing (Col. 3, line 57), on the cooling circuit, an inlet channel (16) and outlet channel (17) for a cooling liquid to provide a closed-loop (see Fig. 2) fluid path extending between an inlet channel and an outlet channel. Capriz et al. fail to disclose a manifold. Strähle et al. disclose the inlet (44) and outlet (46) manifolds. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the cooling device of Capriz et al. with the manifolds of Strähle et al. for the purpose of providing a means to connect a fluid circulation device to the cooling circuit.

With respect to Claim 17, Capriz et al. disclose the claimed invention except for a second intermediate metal plate. It would have been obvious to one having ordinary skill in the art at the time the invention was made to separate the support plate of Capriz into two layers having an a second intermediate layer between the support layer and first pressed metal plate and provide an operation brazing to couple the first plate to a second intermediate plate and the second intermediate plate to the support plate, since it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art. *Nerwin v. Erlichman*, 168 USPQ 177, 179.

With respect to Claim 23, Capriz et al. teach a device for cooling power electronics, comprising: a support plate (2) with a first side (2 top) on which power electronics (5) are mounted; a first plate (6) including a liquid circulation channel (9) formed in said first metal plate; at least one inlet (16) or outlet (17) extending on the first side of the support plate, wherein a cooling circuit (9) for cooling by circulation of a liquid (10) is defined by said liquid circulation channel. Capriz et al. fail to disclose a plurality of cooling channels and a manifold. It would have been obvious to one having ordinary skill in the art at the time the invention was made to duplicate the circulation channels and have a plurality of cooling channels extending in different directions for increased cooling capacity, since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art. *In re Einstein*, 8 USPQ 167. Strähle et al. disclose the inlet (44) and outlet (46) manifolds. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the cooling device of Capriz et al. with the manifolds of Strähle et al. for the purpose of providing a means to connect a fluid circulation device to the cooling circuit.

13. Claim 11 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Capriz et al. (US 6,661,658) in view of Miller (US 2,821,014).

Capriz et al. fail to disclose a plating. Miller teaches said first metal plate (Fig. 2, aluminum alloy structural member) comprises a plating by co-lamination (Fig. 2, aluminum alloy filler metal). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the

cooling device of Capriz et al. with the plating of Miller for the purpose of providing a composite structure for improved assembly of two aluminum alloy structural members without weakening the strength of the structural aluminum alloy parent materials that may be caused by a joining operation.

14. Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Capriz et al. (US 6,661,658) in view of Strähle et al. (US 6,662,859) as applied to claim 12 above, And further in view of Miller (US 2,821,014).

With respect to Claim 13, Capriz et al. in view of Strähle et al. disclose a plating. Miller teaches said first metal plate (Fig. 2, aluminum alloy structural member) comprises a plating by co-lamination (Fig. 2, aluminum alloy filler metal). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the cooling device of Capriz et al. in view of Strähle et al. with the plating of Miller for the purpose of providing a composite structure for improved assembly of two aluminum alloy structural members without weakening the strength of the structural aluminum alloy parent materials that may be caused by a joining operation.

With respect to claim 14, Capriz et al. disclose that liquid cooled heat sinks are made from aluminum, but fail to disclose that the pressed and support plates are made from aluminum. It would have been obvious to one having ordinary skill in the art at the time the invention was made to fabricate the first metal plate from a good thermal conducting metal of aluminum, since it has been held to be within the general skill of a worker in the art to select a known material

on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

15. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Capriz et al. (US 6,661,658) in view of Strähle et al. (US 6,662,859) as applied to claim 16, in view of Fukazu et al. (US 6,648,062) and further in view of Pfeifer et al. (US 7,068,507)

Capriz et al. in view of Strähle et al. disclose the claimed invention except for deflectors and turbulators. Fukazu et al. teach the cooling circuit comprises deflectors (19) situated in the liquid circulation channels (6). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the cooling device of Capriz et al. Strähle et al. with the deflectors of Fukazu et al. for the purpose of providing a means to guide the coolant flow (Col. 4, line 34). Capriz et al. in view of Strähle et al., and in view of Fukazu et al. disclose the claimed invention except for turbulators. Pfeifer et al. teach the cooling circuit comprises turbulators (Fig. 7, 290a) distributed in the liquid circulation channels (see Fig. 7). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the cooling device of Capriz et al. in view of Strähle et al. and further in view of Fukazu et al. with the turbulators of Pfeifer et al. for the purpose of providing a means to create turbulence for increased cooling of the cooling circuit.

16. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Capriz et al. (US 6,661,658) in view of Fukazu et al. (US 6,648,062) as applied to claim 3, and further in view of Pfeifer et al. (US 7,068,507).

Capriz et al. in view of Fukazu et al. disclose the claimed invention except for turbulators. Pfeifer et al. teach the cooling circuit comprises turbulators (Fig. 7, 290a) distributed in the liquid circulation channels (see Fig. 7) (claim 4). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the cooling device of Capriz et al. in view of Fukazu et al. with the turbulators of Pfeifer et al. for the purpose of providing a means to create turbulence for increased cooling of the cooling circuit.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lee et al. (US 5,361,828) disclose turbulators creating turbulence for increased heat dissipation.

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will

the statutory period for reply expire later than SIX MONTHS from the date of this final action.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert J. Hoffberg whose telephone number is (571) 272-2761. The examiner can normally be reached on 8:30 AM - 4:30 PM Mon - Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayprakash Gandhi can be reached on (571) 272-3740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RJH 11/8/07 *RJH*

J. Gandhi
11/13/07
JAYPRAKASH GANDHI
SUPERVISORY PATENT EXAMINER